

COLLABORATIVE INFORMATION SYSTEM ENGINEERING AS A SUPPORTING LEARNING TOOL FOR ENGLISH FOR BUSINESS TOPIC

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ABSTRACT

Learning environment in higher education can be transformed from teacher-centered environment into the combination of learner, knowledge, and assessment-centered environment. Therefore, students learning collaboration which can lead into competent community in line with the programs' goals, can be created. Teacher-student interaction which is usually conducted in the classroom needs to be managed in order to build students' deep learning understanding. Based on the learning interaction among learning resources, teacher and student, an information system is engineered. This system is an information system which functions as a Collaborative Learning (CL) supportin tool for English subject, specifically for English for Business topic. Research in CL can be viewed from seven perspectives. They are collaborative interaction control, task from CL, learning theories in collaboration, CL environment engineering, students' roles, collaboration domain and learning methodologies that support collaborations (Cs). Among those perspectives, CL environment engineering becomes the basis in engineering information system which collaborates text, audio, video and picture as an interaction tool. The specification of this interaction tool is based on the content of each lecture. The research begins by analysis phase which covers the analysis of the content of lecture and spreading quesionnaire. The questionnaire is designed to get information on the necessity level of information system and the description of current learning system. After the information of need specification is obtained, the phase of information system engineering is conducted. In this phase, the modelling of process, data, menu structure and user interface is created. Data modelling uses Data Flow Diagram (DFD) which consists three entities: administrator, English lecturers and students. Data modelling engineered uses Entity Relationship (ER) to relate data entity and produces 14 tables, whereas menu structure modelling and user interface are created to show information system design in the implementation-phase-to-be.

Key words: Collaboration, Information System, Learning, DFD, English

1. INTRODUCTION

The biggest challenge in higher education is to create learning environment which is able to equip students with cognitive skill to conduct analysis, synthesis and make conclusion. Learning environment can be transformed from teacher-centered environment into the combination of learner, knowledge, and assessment-centered environment. Therefore, students learning collaboration which can lead into competent community in line with the programs' goals, can be created.

Learning can be classified into several domains. Picture 1 shows learning domains which can help in engineering learning process by determining learning character needed [Ele].

Domains of Learning	
Accretion Learning is continuous - Function of environment - At the point of need - Variety of sources "learning foraging" Benefits: Tight link to need, high relevance, broad range of learning (tacit, explicit), continuous, modelled after "real life" Drawbacks: Learners often unaware of learning (devalue process), at odds with how learners have learned in the past (unfamiliar with process)	Transmission Traditional view of learning - Courses - Lectures - Instructor-in-control Benefits: Good for structured information, building core knowledge, compliance training Drawbacks: Instructor-based, learner viewed as "container to be filled", long development time, at odds with how much learning happens
Acquisition Learner chooses to learn - Exploratory - Inquiry-based - Learner-in-control Benefits: Learner highly motivated, relevance, related to personal interests Drawbacks: Learner may not be learning "right" skills, feedback from expert may be lacking	Emergence Learner reflection and reasoning - Metacognition - Reflection on life experiences - Cognition Benefits: Tacit learning, deep learning, relevance, higher order thinking skills, fosters creativity and innovation Drawbacks: Time consuming, hard to do, requires high competence of subject matter

Picture 1.1. Learning Domain

Learning consists of four domains, they are transmission, acquisition, accretion and emergence [Uws].

1. Transmission is a process of delivering information, knowledge, ideas and skills to others by direct delivery, demonstration and guidance. The success level of this domain is 10%.
2. Acquisition provides choices in learning and is the most relevant with students. This method covers *exploring, experimenting, self-instruction, inquiry, and general curiosity*. Currently acquisition produces 20% of the learning success.
3. Accretion consists of learning phases which often take place without the learners realize them like the process of learning language, culture, habit, making assumption, social norm and attitude. This process can take place anywhere and leads to 70% of the learning success.

4. Emergence is the construction of structured and patterned ideas and understandings that have never existed before. It is also the mix between thinking and interaction. The learning processes can be in the forms of synthesis, creativity, intuition, policy and problem solving.

This method is not limited by time and can produce new knowledge. This method is strongly related to inspiration and originality. In current education practical context, this domain contributes 1-2% to the success of learning process.

This research focuses on the engineering of information system as Collaborative Learning supporting tool since the character of collaboration can encourage students to participate. Research in CL can be viewed from seven perspectives. They are collaborative interaction control, task from CL, learning theories in collaboration, CL environment engineering, students' roles, collaboration domain and learning methodologies that support collaborations (Cs). These seven perspectives are important dimensions in CL which should be put in consideration when designing, constructing and using CL system.

As an integrated revision, an information system engineering as English supporting learning tool for English for Business topic is proposed. This information system can be the basis for developing academic activities and can maximize the potential of all involved learning communities.

2. LITERATURE REVIEW

Collaborative learning (CL) is a learning approach which is used for teaching and learning process that involves groups of students collaborate in solving problems, doing assignments or creating products. CL is based on the idea that learning is a natural social interaction among learners. Through this interaction or discussion, learning process takes place.

The following are some approaches used in CL:

1. Learning is an active process in which learners assimilate with information and relate the new knowledge to their prior knowledge.
2. Learning provides more opportunities to learners to work actively with their partners in processing and synthesizing information rather than simply remembering the information.
3. Learners gain more advantages by getting different perspectives from their partners who may have different backgrounds.
4. Learning becomes a social environment when the interaction among learners occurs.
5. In CL environment, learners have the opportunity to hear different views socially and emotionally, need articulation or depend their

ideas. Therefore unconsciously learners start building their conceptual framework.

The current system modelling tool used is a flowmap called System Flowchart which portrays the flow of the system thoroughly. The flowchart explains the steps in procedures of the system. Flowchart is described through certain symbols.

The aim of the flowchart is to show the flow of documents used in a system. Flowchart is used as a communication and documentation tool as well. Meanwhile, for process engineering modelling tool Data Flow Diagram (DFD) is used. DFD is used to describe the working flow of the under construction or undergoing system. DFD is a structured modelling tool which consists of several levels.

Context diagram is the beginning phase in engineering structured system. It is a description of a system in general which describes the flow of data from and into a system. It is also a description pattern which shows the interaction between an information system with its environment. In this description, system is not explained in detail since the focus is the interaction between the system and the environment that accesses it.

Data modelling used in this research is Entity Relationship (ER) which shows the relationship between two files or two tables classified into three relationship types: one to one, one to many and many to many. Entity-Relationship model consists of Entity Set components and Relationship Set, each is equipped by attributes that present all facts. This model can be described more systematically by using Diagram Entity-Relationship (Diagram E-R).

Information collection method used in this research is Kano method (Source: Noriaki Kano, 1984). This model is developed to get information of users' satisfaction on a certain product quantitatively. Users' satisfaction can be used in mapping the features of product that will be launched. For measuring a site, the features in the site will be the aspects to be measured. In Kano method, users' satisfaction is a requirement of a product's feature.

3. RESEARCH METHODOLOGY

This research is a developing research since it develops methods and plans for English learning by developing collaborative software.

The target population are English lecturers and students of Politeknik Pos Indonesia.

Sampling technique used is Cluster Random Sampling. It is a technique of choosing sample from small unit groups. Cluster population is subpopulation of total population. Cluster grouping

produces heterogen elementary units similar to the population itself (Nazir, 1988: 366).

Variables involved in this research can be explained through the following operational definitions:

- External and internal parties involved in English learning
- Vision, mission, strategies and critical success of language centre
- Learning methods and elements and learning strategy and evaluation

Methodology for this research is Rapid Application Development (RAD). RAD is a developing system method in relatively short time. Normally, the time needed in developing an information system is 180 days at least, but RAD enables a system development only in 30-90 days.

4. RESULTS

Currently, English learning system in Politeknik Pos Indonesia is still conducted manually with conventional method, in which English lecturers use reference books for learning and teaching material in the class. The materials are usually given in the class, right before the class starts. Therefore, students only have limited time to read and understand them.

This kind of learning method has some disadvantages. For example, when an English lecturer is absent for teaching, there is no lecturer that gives the lecture. It means learning and teaching process at that time does not occur. That is why this method needs to be developed so that learning and teaching process can be more efficient, modern, and will not make students bored.

Collaborative information system engineering as a supporting learning tool is created to provide alternative teaching method through online teaching and learning. This system is designed to improve the quality of education and students' knowledge and skill. It is hoped that students can use this technology well and it can be supporting facility for teaching learning process apart from teaching learning process in the class.

Business users in Politeknik Pos Indonesia cover:

1. Academic and Student Affairs Administration Unit which carries out administration of Politeknik Pos Indonesia.
2. English lecturers
They are responsible for teaching and conducting workshop as well as for giving information about students in regard with counselling and consultancy affairs.
3. Students
They are taught, given exercise and receive consultancy and counselling.

Procedure of teaching and learning English covers:

1. English lecturers give lecture and teach in the class based on the curriculum of Politeknik Pos Indonesia.
2. After they give lecture, English lecturers give assignments to students.
3. Students learn learning material and join class session.
4. Students do the assignments given by English lecturers.
5. English lecturers give marks based on students' assignments.
6. English lecturers archive students' marks.

Event list occurring in engineering web-based collaborative information system as learning tool for English for Business topic in Politeknik Pos Indonesia can be seen in the following table:

Table 4.1. Event List

No	Event Name
1	English lecturers fill in personal data form and are registered as English lecturer user.
2	Students fill in personal data form and are registered as students user.

Coding in data processing process for collaborative information system as a learning tool for English for Business topic covers students' number coding.

The research conducted in Politeknik Pos Indonesia shows that students think that English teaching and learning process conducted directly in the class is not effective and maximum enough. Therefore a system that can improve the teaching and learning process mentioned earlier is required. One of the solutions to develop English teaching

and learning process in Politeknik Pos Indonesia is by developing web-based e-learning system which can be accessed by English lecturers and students at any time and wherever they are. There are some hindrances in developing the information system software. They are:

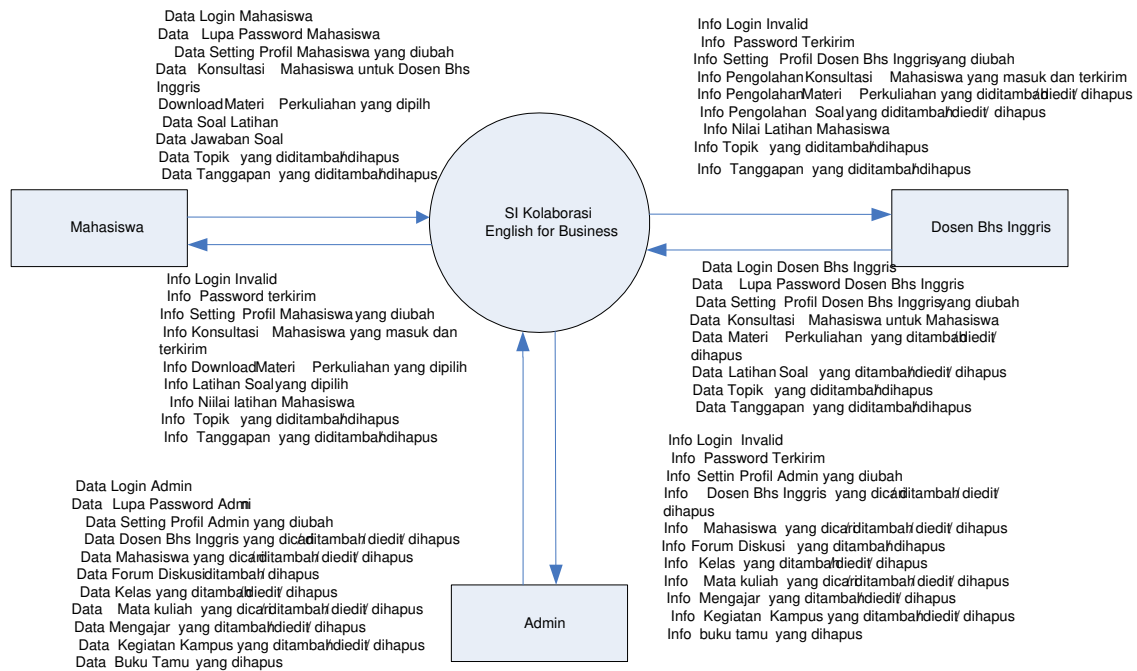
- a. Lack of information facilities for promoting and providing information to society. This e-learning site, therefore, can be an information media which displays information about Politeknik Pos Indonesia thoroughly and interestingly.
- b. English teaching and learning process is only conducted once a week. This makes learning material given to and absorbed by students is very limited.
- c. An English lecturer may not be able to teach for some reasons. This web-based information system can be an alternative teaching and learning tool for English lecturers in giving lectures.
- d. Sometimes it is difficult for students to get books or reference for learning material. The expensive book price factor also makes students more difficult to get learning material.

By using Kano method, a questionnaire is designed. This questionnaire will try to obtain information about the features that will appear in collaborative information system for English for Business topic. Topics in the questionnaire will cover two types of questions: functional question (FS) and disfunctional question (DFS). The questionnaire is designed and then given to 14 English lecturers in Politeknik Pos Indonesia. The result of the questionnaire is shown in table 4.2.

The conclusion is that topics with multilayer importances that must exist (must be) and if they exist, users will be more satisfied (attractive) are:

No	Topic	Characteristic
1	E-learning for English for Business learning process	Must be
2	Softcopy of learning material that can be downloaded by students	Attractive
3	Learning communication/interaction conducted through e-learning system	Must be
4	Assignments given through e-learning system	Must be
5	Handing in assignments through e-learning system	Attractive
6	Students' grades are informed through website	Must be
7	Tests/Quizzes are given through website	Must be
8	Lecturers provide learning material in softcopy form	Must be
9	Learning media collaboration is available in e-learning system	Must be

DFD level 0 in collaborative information system engineering as a learning tool for English for Business topic can be seen in the following picture 4.1.

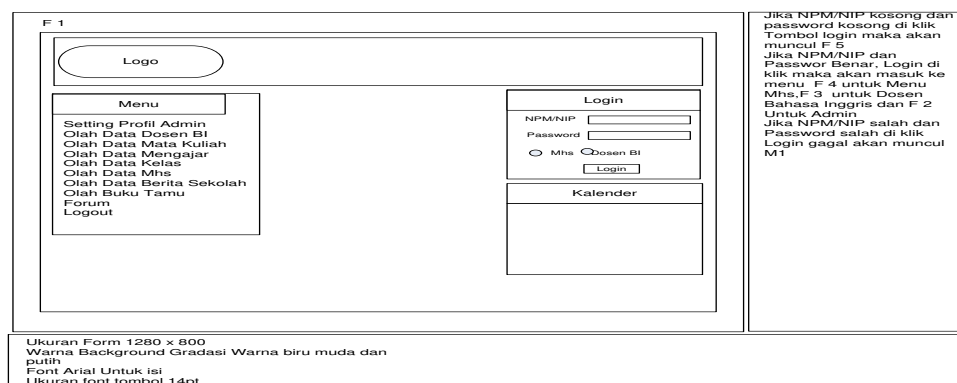


Picture 4.1 Context Diagram of Collaborative Information System for English for Business

The following is the picture of interface engineering specification of collaborative information system as a supporting learning tool for English for Business topic in Politeknik Pos Indonesia.

Home Display Engineering

The following is home display in which users or visitors can see some information or log into the system.



Picture 4.2. Home Display Engineering

5. CONCLUSION AND SUGGESTIONS

Collaborative Information System for English for Business topic is web-based system which can be a supporting tool in teaching and learning process. In this regard, teaching and learning in the class is still the main activity. Information system produced can help lecturers in providing learning material through online system.

After conducting the research, some conclusions can be drawn:

1. Information system engineering has provided the feature to process learning material and tests for all students digitally. The learning materials are based on the curriculum.
2. Information system engineering has provided the features of material upload and download as well as discussion forum between English lecturers and students that can be accessed at any time and anywhere.
3. Information system engineering has provided simulation feature which is related to learning materials. The simulation is in multiple choice form. The simulation is designed to evaluate students; to find out whether they understand the material. This simulation is also designed to encourage students' learning motivation.

For further development, some suggestions are given:

1. Implementing and testing information system engineering that has been created
2. Adding the feature to change themes so that graphic interface display (template) can be changed according to users' preference.

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